

## **Impact of Sitka spruce (*Picea sitchensis* (Bong.) Carr.) afforestation on the carbon stocks of peaty gley soils - a chronosequence study in the north of England**

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Afforestation results in the sequestration of atmospheric CO<sub>2</sub> as trees grow. In some circumstances afforestation on organo-mineral or organic soils may result in the substantial loss of soil C due to soil disturbance during forest planting. However, there is little quantitative evidence for such impact. This study aimed to quantify the long term impact of afforestation with Sitka spruce (*Picea sitchensis*) on C stocks of peaty gley soils through the first and second rotation phases based on a chronosequence representing approximately 100 years compared to soil C stocks from the previous land use (rough grazing of the dominant heather moorland/blanket bog). The findings suggested that the carbon lost through leaching, oxidation and decomposition from peat layers due to the likely disturbance by soil preparation for afforestation, clear-felling and reforestation could be compensated for by the C accumulation in organic upper horizons, so the overall influence was neutral over two forest rotations.